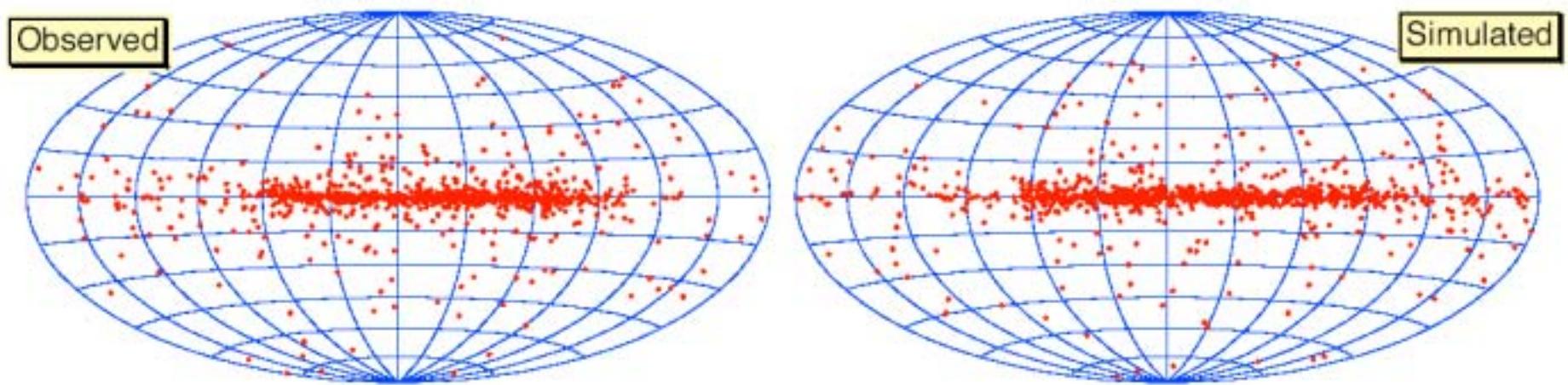


Pulsar contribution to EGRET and GLAST diffuse galactic emission

- Use results of neutron star population synthesis
- Compute number of expected pulsar (point source) detections with EGRET and GLAST
- Sum emission from undetected pulsars beamed toward us

Neutron star population synthesis – Detected and “detected” radio pulsars

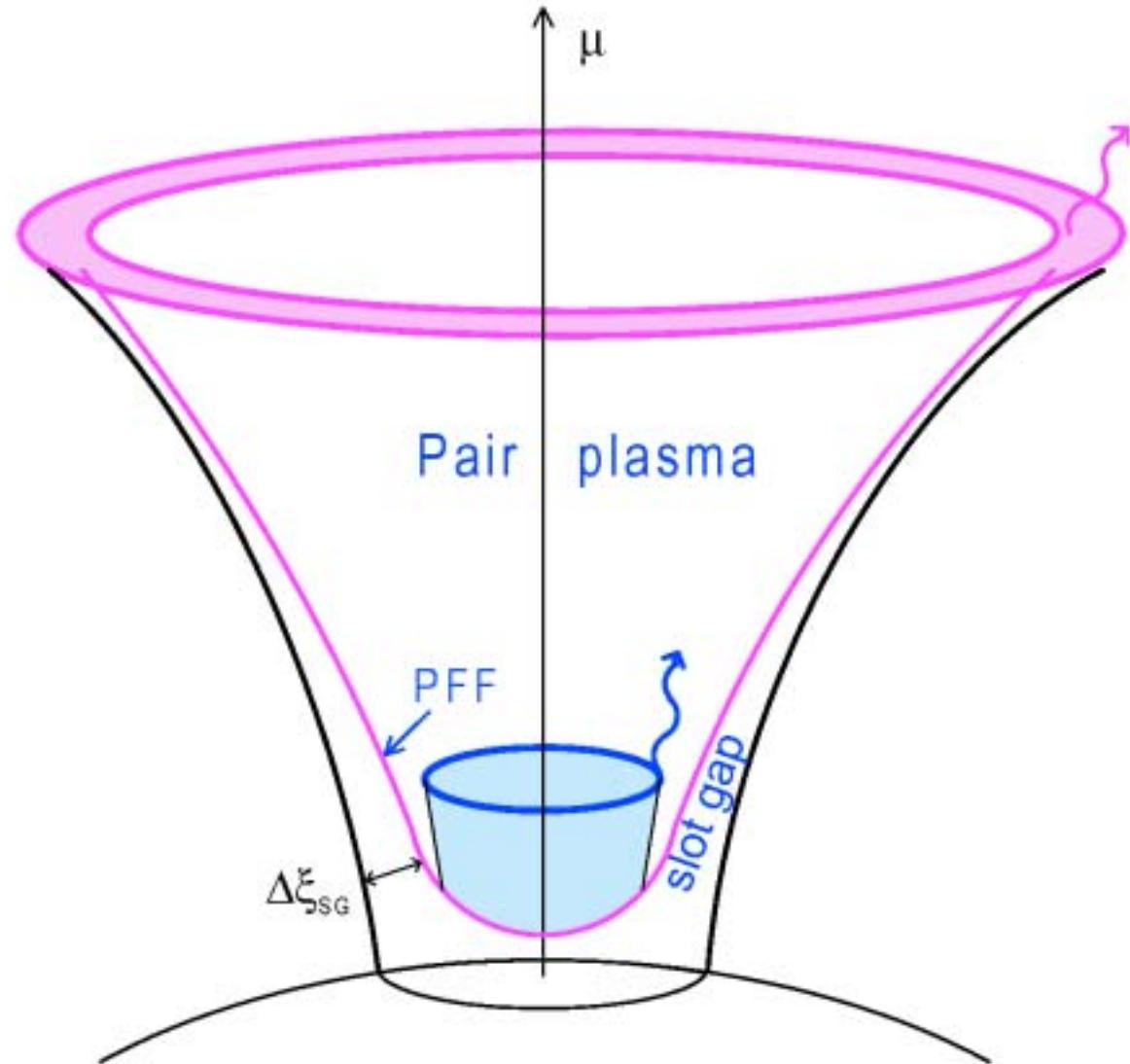
Gonthier et al. 2002, 2003



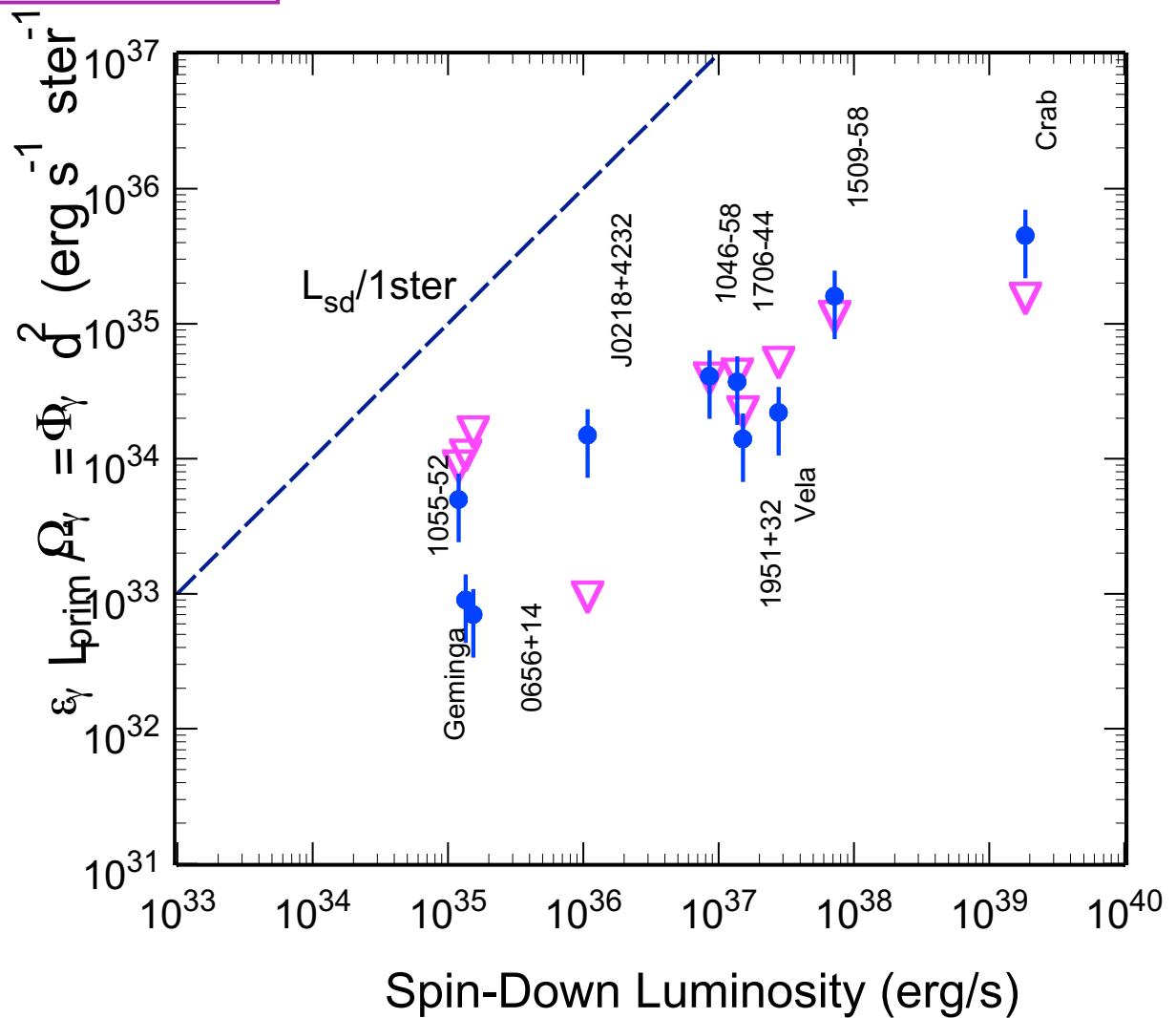
Nine radio surveys including Parkes Multibeam

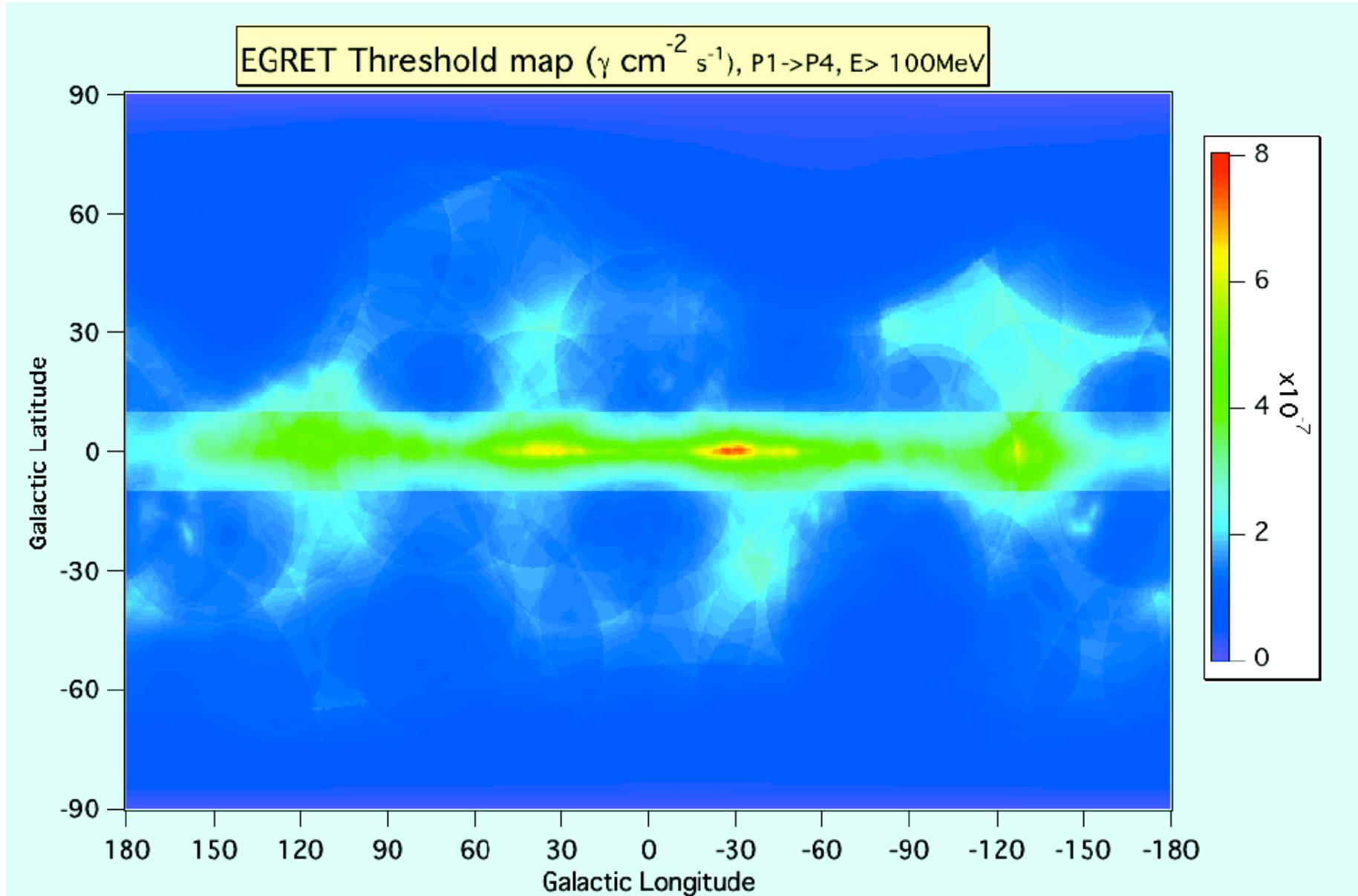
Polar slot gap

- $E_{\parallel} \rightarrow 0$ near last open field-line (Arons 1983)
 - Slower acceleration
 - Pair formation front at higher altitude
 - Slot gap forms between conducting walls
- E_{\parallel} from inertial frame-dragging (Muslimov & Tsygan 1992; Harding & Muslimov 1998)
 - Acceleration, pair formation and slot gap forms a rim around PC
- γ -ray beam has large opening angle with small solid angle



High energy “luminosity” from slot gap





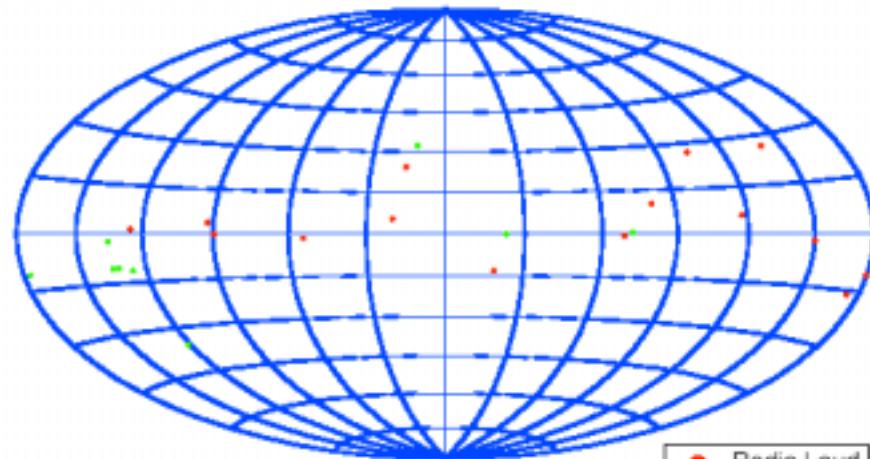
Courtesy of Isabelle Grenier

GLAST point source thresholds

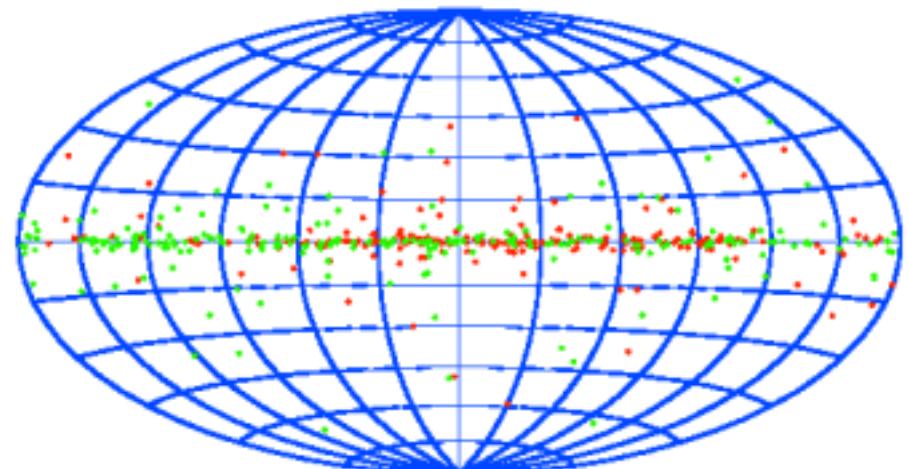
- In-Plane $|b| < 10^\circ$ - 5.0×10^{-9} photons/cm²/s
- Out-Plane $|b| > 10^\circ$ - 2.0×10^{-9} photons/cm²/s

“Detected” gamma-ray pulsars

EGRET

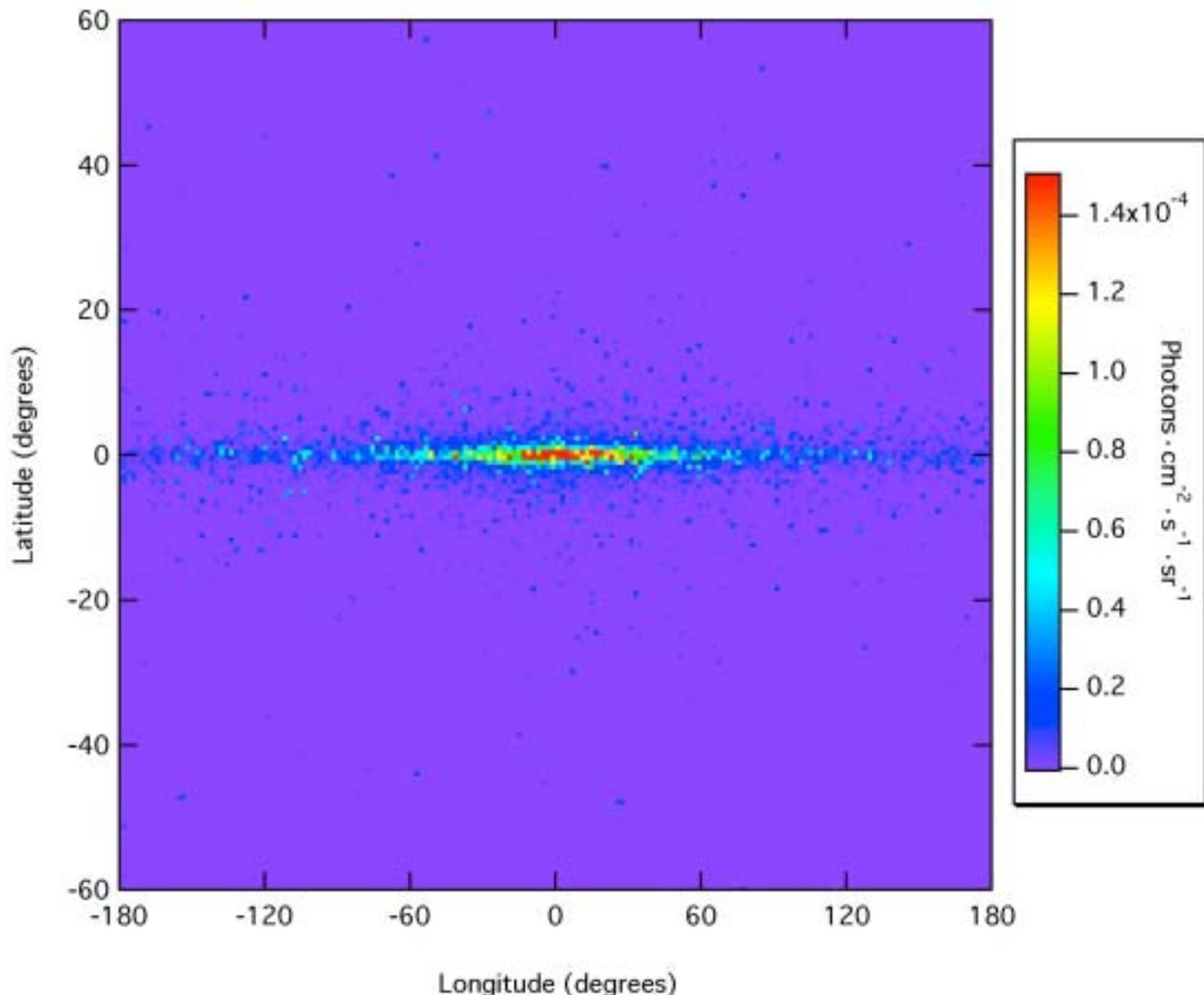


GLAST

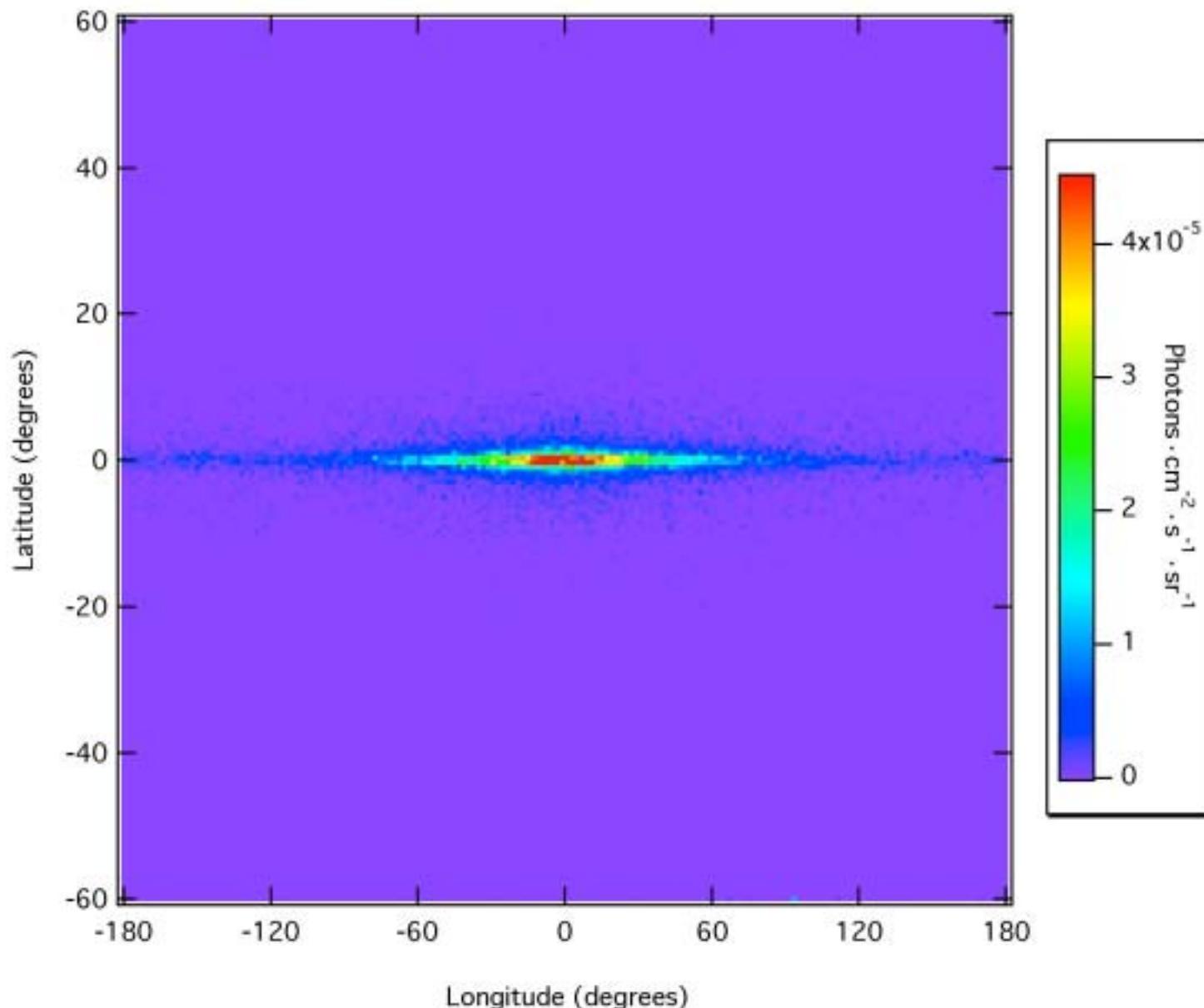


	Radio-loud	Radio-quiet
<i>EGRET</i>	25	8
<i>GLAST</i>	363	370

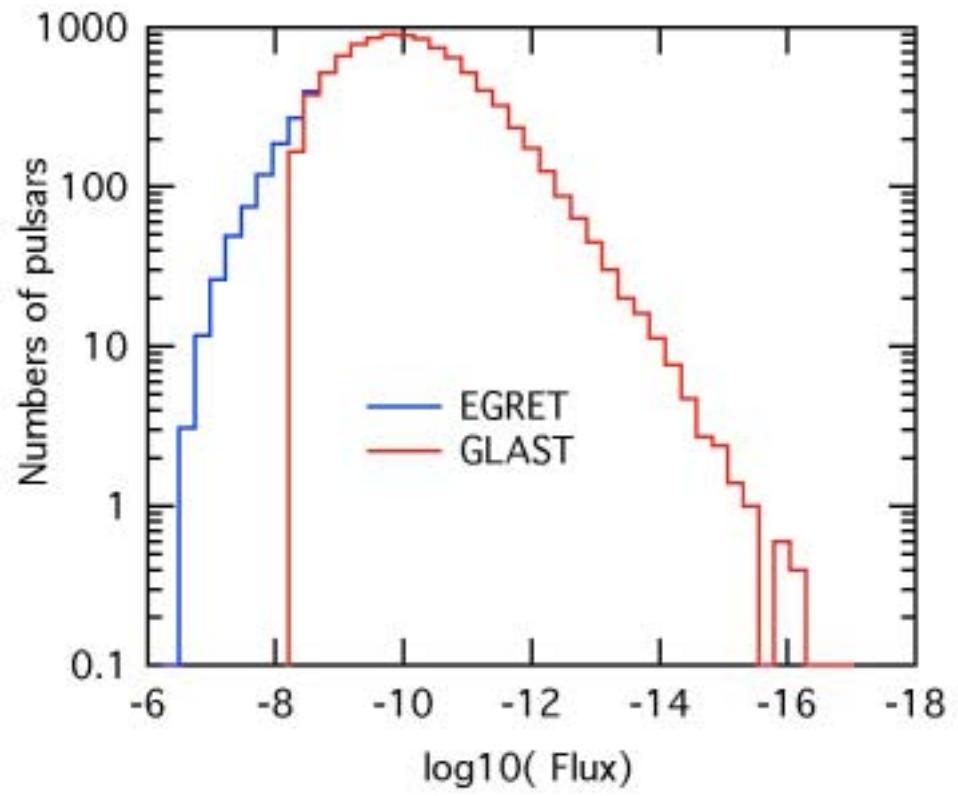
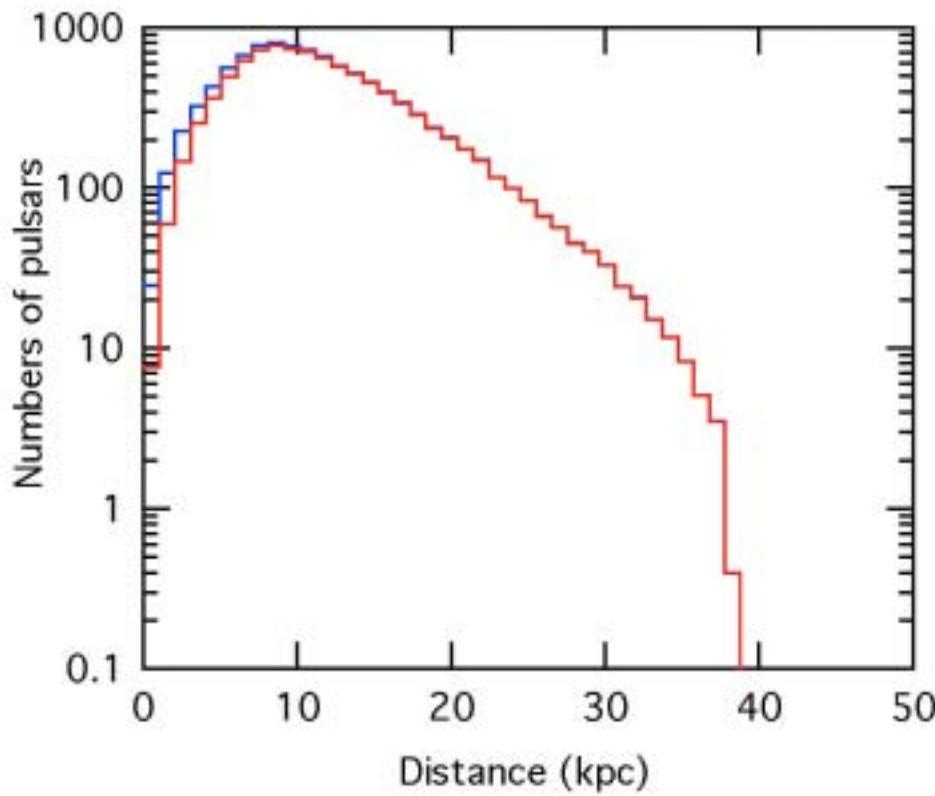
Diffuse contribution from undetected pulsars - EGRET



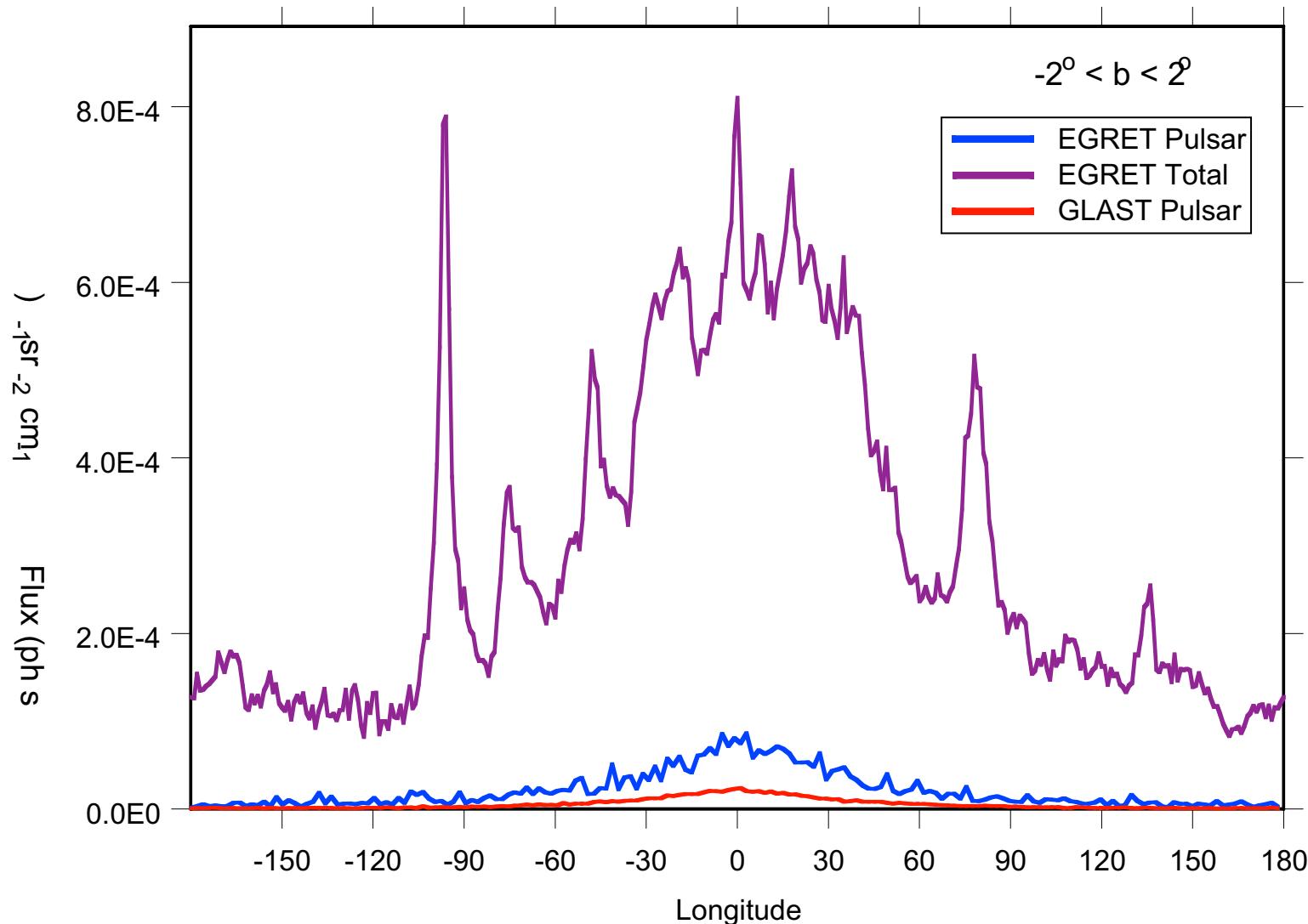
Diffuse contribution from undetected pulsars - GLAST



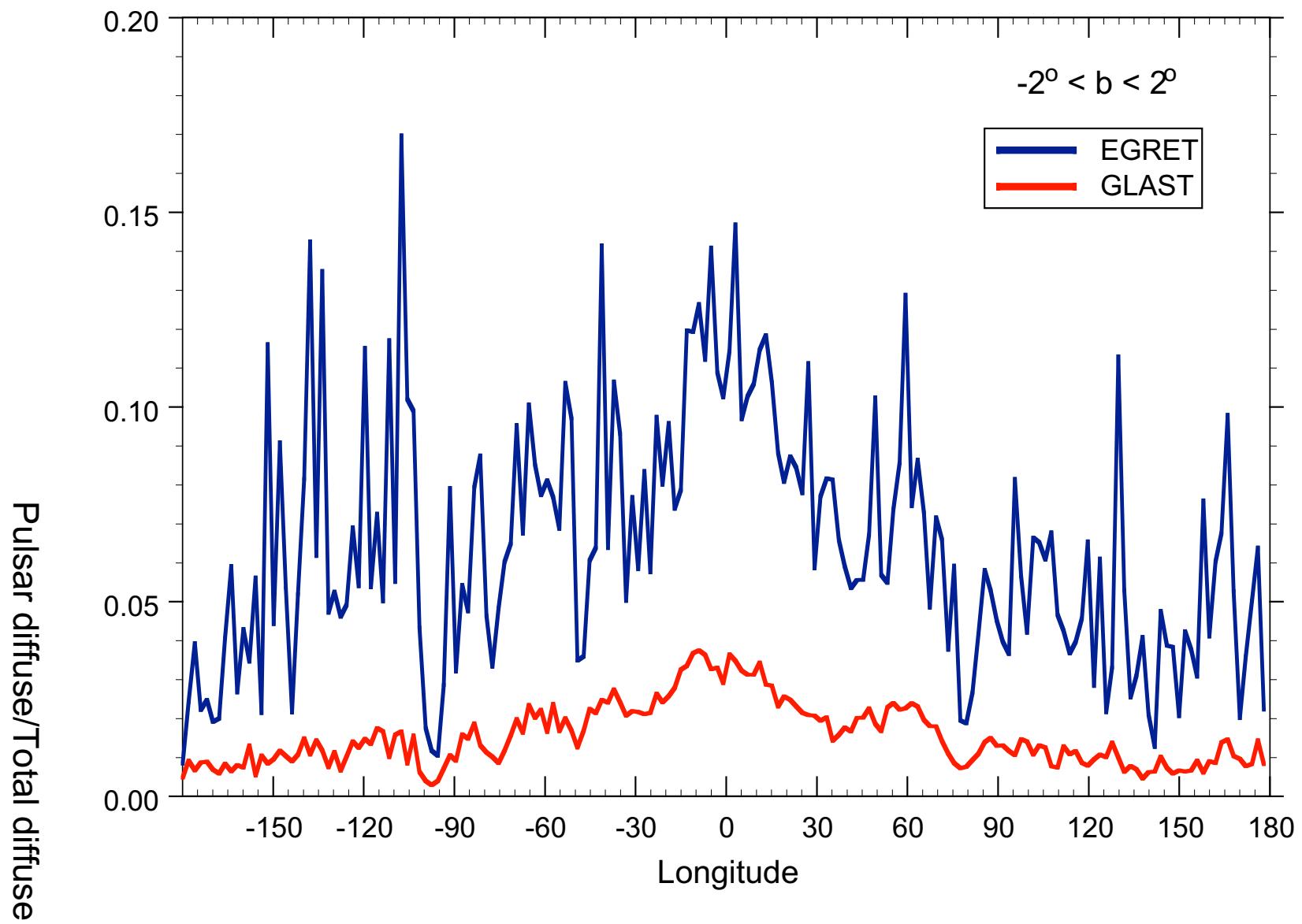
Undetected pulsars – distance and flux distribution



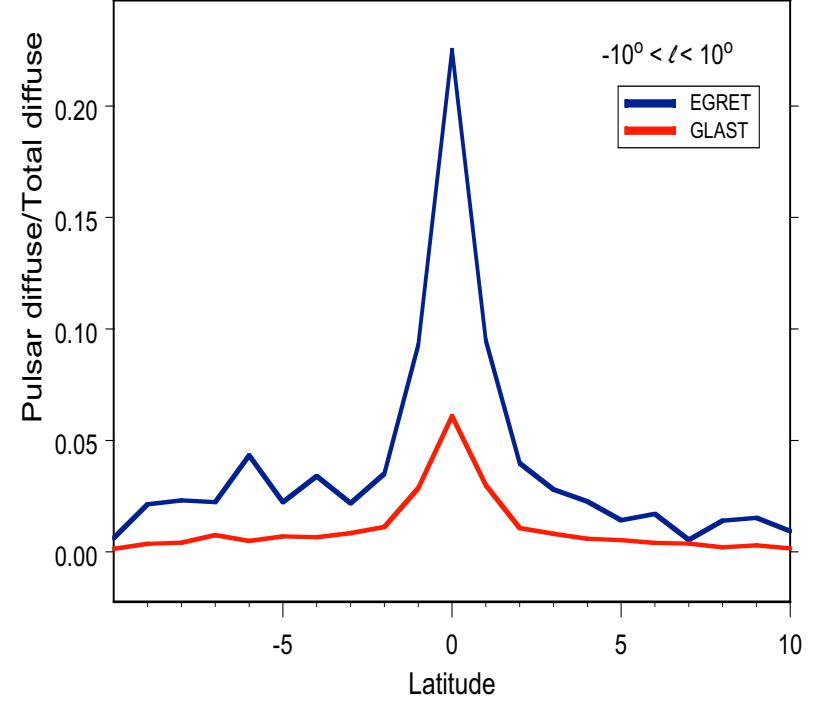
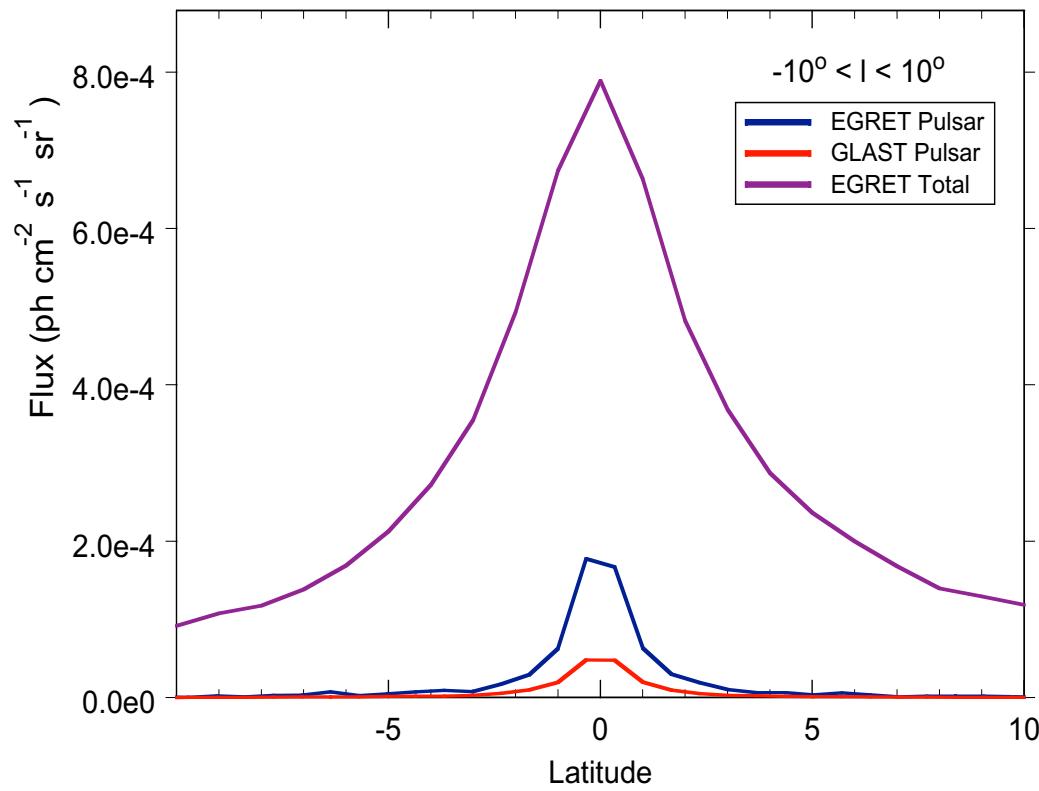
Longitude distribution



Pulsar diffuse fraction vs. longitude



Latitude distribution



Summary

- Preliminary results:
 - Resolving many pulsars as point sources will reduce their contribution to the diffuse emission for GLAST by a factor of > 3 compared to EGRET (> 100 MeV)
 - Relative pulsar contribution peaks toward the Galactic center and at low latitude
- Future results:
 - Dependence of pulsar contribution on energy
 - Use of GLAST exposure map (?)